A review of evidence about behavioural and psychological aspects of chronic joint pain among people with haemophilia

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Summary

Joint pain related to haemophilia affects large numbers of people and has a significant impact on their quality of life. This article reviews evidence about behavioural and psychological aspects of joint pain in haemophilia, and considers that evidence in the context of research on other chronic pain conditions. The aim is to inform initiatives to improve pain self-management among people with haemophilia. Reduced pain intensity predicts better physical quality of life, so better pain management should lead to improved physical quality of life. Increased pain acceptance predicts better mental quality of life, so acceptance-based approaches to self-management could potentially be adapted for people with haemophilia. Pain self-management interventions could include elements designed to: improve assessment of pain; increase understanding of the difference between acute and chronic pain; improve adherence to clotting factor treatment; improve knowledge and understanding about the benefits and costs of using pain medications; improve judgments about what is excessive use of pain medication; increase motivation to self-manage pain; reduce negative emotional thinking about pain; and increase pain acceptance. The influence of behavioural and psychological factors related to pain are similar in haemophilia and other chronic pain conditions, so there should be scope for self-management approaches and interventions developed for other chronic pain conditions to be adapted for haemophilia, provided that careful account is taken of the need to respond promptly to acute bleeding pain by administering clotting factor.

Key Words: Chronic join pain, haemophilia, pain acceptance, pain coping, self-management.

Introduction

People with haemophilia are susceptible to joint bleeds (haemarthroses). These are caused when small blood vessels in the joint are ruptured and the joint space fills with blood, causing severe acute pain. Recurrent joint bleeds damage the joints, leading to arthropathy and severe chronic pain [1-4]. Bleeds can be minimized and arthropathy can be prevented by early preventative (prophylactic) clotting factor treatment [5, 6], so most of those affected by severe joint pain grew up before clotting factor concentrates were available, or live in parts of the word where they are still not available.

Large numbers of people are affected by chronic joint pain, however, even in developed countries. A survey of over 5,000 adults with haemophilia at 22 European treatment centers showed that 67% had arthropathy and 35% had chronic pain [7]. In one sample in the Netherlands, two-thirds of adults with severe haemophilia had one or more painful joint, most commonly an ankle [8]. In a study in Germany, half of the adults with haemophilia reported pain throughout the day if no treatment was applied, most commonly in the ankle, knee, spine and elbow, and 29% reported that pain persisted after clotting factor treatment. Chronic pain restricted the daily activities of 89% of the sample, and affected the mood of 85% [9]. In Poland, almost all elderly patients with haemophilia were reported to have arthropathy [10].

A recent review highlighted the limited treatment options currently available for haemophilia-related pain [11], and a recent survey showed that only eight of 22 European treatment centers had specific guidelines for managing pain: “There is little published evidence to guide pain assessment and management in PWH [people with haemophilia], and clinical practice varies considerably across Europe. General and specific recommendations are needed” [7, p. 743]. Guidelines for assessment of pain and for surgical and pharmacological management of pain are now being developed [7, 11], but to my knowledge there are no evidence-based guidelines or recommendations about self-management of pain or about behavioural and psychological aspects of pain in haemophilia.

This paper reviews evidence about behavioural and psychological aspects of haemophilia-related chronic joint pain. The aim of the review is to inform initiatives to improve self-management of chronic joint pain among people with haemophilia. The review first examines evidence about links between pain, pain coping, pain acceptance and quality of life, and then examines evidence about efforts to improve self-management of chronic joint pain. The research findings are considered in the context of evidence from chronic pain conditions in which research on pain self-management is more advanced than in haemophilia.

Pain, coping, acceptance and quality of life

Physical health-related quality of life, which includes everyday activities and functioning, is worse among people with haemophilia than the general population [12, 13] and, among people with haemophilia, it is worse among those with more joint damage and better among those

receiving prophylactic clotting factor treatment [14-16]. Mental quality of life, which includes social and emotional wellbeing and adjustment, is less affected by haemophilia and less closely associated with joint status [17, 18]. Most quality of life studies of people with haemophilia are cross-sectional and most focus on medical and clinical factors as predictors, with fewer longitudinal studies and studies of pain and behavioural aspects of pain, such as coping and acceptance, as predictors of quality of life.

In other chronic pain conditions, severity of pain affects quality of life [19], so pain severity should be measured and accounted for in studies of factors like pain coping and pain acceptance. Pain coping usually refers to the purposeful efforts people make to control or avoid pain, whether or not those efforts are successful [20], although measures of pain coping often also include negative emotional thinking about pain, such as fear, anger or catastrophizing, which probably reflect emotional distress related to pain rather than efforts to cope [21]. In chronic pain conditions such as low back pain, active behavioural or cognitive pain coping strategies were associated with positive outcomes and better quality of life, whereas negative emotional thinking about pain and passive coping strategies like rest, prayer and hope were associated with poorer outcomes and worse quality of life [20].

Among people with haemophilia, pain coping strategies were similar to those among people with other painful chronic conditions [22, 23], and did not differ between people registered with comprehensive care centres and other haemophilia centres [24]. Active pain coping was associated with greater readiness to self-manage pain, whereas negative thoughts about pain and passive pain coping were associated with less readiness to self-manage pain [25]. Negative thoughts about pain were associated with beliefs that chance factors were responsible for pain control and with concerns about drug use, whereas passive pain coping was associated with beliefs about doctors being responsible for pain control, more frequent visits to healthcare professionals, and greater use of analgesic medication [22, 24].

The emphasis in much chronic pain research has turned from pain coping to pain acceptance, because when pain is chronic, attempts to control or avoid it may inevitably be unsuccessful and counter productive. Pain acceptance means recognizing that pain cannot always be avoided or controlled and that pain should not prevent efforts to engage with other valued goals and activities [26]. Research in chronic pain conditions shows that acceptance rather than coping is often a better predictor of outcomes [27]. For example, among people with chronic musculoskeletal pain, pain acceptance predicted pain disability and distress after controlling for a range of other variables including pain intensity [28].

Very few studies of quality of life among people with haemophilia included measures of pain intensity, coping and acceptance. One cross-sectional study showed that pain intensity was the main influence on physical quality of life and negative thoughts about pain were the main influence on mental quality of life. Pain acceptance had a small but significant influence on both mental and physical quality of life, but active coping did not influence either physical or mental quality of life [29]. A longitudinal study showed that changes in pain intensity were the main influence on physical quality of life, and changes in pain acceptance were the main influence on

mental quality of life. Again, active pain coping was not a significant influence on either physical or mental quality of life [30].

In the longitudinal study, age and haemophilia severity were both associated with poorer physical quality of life, but their effects on quality of life at follow-up were almost entirely accounted for by the baseline measure of quality of life [30]. This does not mean that age and severity are not important influences, just that they have static effects that do not change over time, so they contribute to continuity rather than change in physical quality of life. By contrast, reductions over time in pain intensity predicted better physical quality of life at follow-up, and increases over time in pain acceptance predicted better mental quality of life, independently of quality of life at baseline [30]. This suggests firstly that efforts to improve pain management in haemophilia are worthwhile, for reductions in pain should translate into improved quality of life, and secondly that pain acceptance could be a useful target for efforts to improve mental quality of life in haemophilia. More generally, these studies suggest that haemophilia is similar to other chronic pain conditions in terms of how pain intensity, coping and acceptance are related to quality of life.

Self-management of chronic joint pain

Self-management initiatives for haemophilia have focused mainly on self-administration of clotting factor concentrates [31, 32], which is vitally important because clotting factor treatment is the key to effective haemophilia management. Physical activity is also important, for physiotherapy was associated with reduced pain and improved functional ability [33], and exercise programmes designed specifically for people with bleeding disorders led to improvements in joint motion, strength and walking ability [34].

There is also a need for improved self-management of joint pain, however, for 39% of people with haemophilia surveyed in the US believed their pain was not well treated, and many reported using alcohol and illicit drugs to manage pain [35]. Perhaps the first and most critical aspect of pain self-management for people with haemophilia is to differentiate acute bleeding pain from chronic joint pain, so that clotting factor can be used promptly in response to acute bleeding pain. There is evidence, however, that many people with haemophilia do not adequately differentiate one type of pain from the other. In one study, people with haemophilia used similar descriptors for acute and persistent pain, and many reported using clotting factor to treat persistent pain, or failed to use factor treatment to treat acute pain [36]. One approach to joint pain self-management is summarized as Rest, Ice, Compression and Elevation (RICE), which for acute bleeding pain should be supplemented with clotting factor, and in fact those were the five most frequently used pain management strategies among respondents to one national survey [35].

Knowledge about analgesics is important because certain pain medications, including aspirin, salicylate, ketorolac, and indomethacin, are not recommended for people with haemophilia because they can affect platelet function and can increase the risk of gastro-

intestinal bleeding [7], but there is little research evidence about patients' or practitioners' knowledge and beliefs about pain relief for haemophilia-related joint pain. Opiate pain medications such as morphine do not have known side-effects specific to haemophilia, but often raise more general concerns about dependence. There is actually very little evidence about substance dependence in haemophilia. One study reported that 39% of adolescent and adult haemophilia patients in Iran were substance-dependent, but this included nicotine dependence [37]. The risk of addiction to opiates used to manage pain is probably much less than many people with haemophilia and their healthcare providers might estimate, for in one review of studies of chronic pain patients taking opiate analgesics, the overall proportion who became addicted was only 3.27% [38].

In a survey of European treatment centres, strong opiates like morphine were rarely used, although weaker opiates like tramadol and codeine were used by several centres. Pain specialists were rarely consulted, and haemophilia specialists were the most common prescribers of analgesics [7]. In one sample in the Netherlands, 36% of those with joint pain used analgesics, most commonly paracetamol and ibuprofen [8]. In a sample in Germany, 76% of people with severe haemophilia took analgesics daily, most commonly non-steroidal anti-rheumatic drugs such as acemetacin, diclofenac and ibuprofen [9]. In a UK sample, 53% of people with haemophilia had used over-the-counter analgesics, 34% had used prescription analgesics, and 21% had used illicit drugs in the last month [24].

In a large survey of people with haemophilia in the US, the most commonly used pain medications were short-acting opiates, which were used by 55% for acute pain and 48% for persistent pain; paracetamol (acetaminophen) was used by 53% for acute and 46% for persistent pain; non-steroidal anti-inflammatory drugs by 36% for acute and 36% for persistent pain; long-acting opiates by 21% for acute and 24% for persistent pain; and illicit drugs by 8% for acute pain and 8% for persistent pain. Like in Europe, most pain management was provided by haemophilia treatment centres or primary care providers, and relatively few people reported treatment by pain specialists [35].

In other painful chronic conditions, considerable attention has been devoted to developing and evaluating pain self-management interventions, usually in the form of small-group education sessions, often drawing on principles from cognitive-behavioural therapy [39]. For example, several randomized trials of group self-management interventions for people with chronic pain showed positive findings [40-42], though one with older adults did not [43]. Self-management programs have also been effective in arthritis [44-46], though not all studies showed benefits [47].

Perhaps the most comparable self-management initiatives for people with haemophilia were efforts in the 1980s to develop self-regulation techniques to reduce the impact of chronic arthritic joint pain [48-50]. These were developed from previous findings on the relief of arthritic pain, and focused on progressive muscle relaxation exercises, meditative breathing, and guided imagery. In one evaluation with three people with chronic haemophilia-related arthritic pain, for example, those techniques reduced the rated intensity of arthritic pain, improved sleep and

mobility, and reduced analgesic use [51]. Self-hypnosis was also reported to reduce distress and clotting factor consumption [52].

More recent pain self-management initiatives for painful chronic conditions used web-based or video-based materials, which can be delivered to larger numbers of people at relatively low cost, and can be accessed in a flexible way, including at home. Home-based or internet-based self-management interventions produced improvements for people with chronic low back pain [53, 54], and arthritis [55, 56].

Considerable attention has also focused on increasing motivation or 'readiness' to self-manage pain, for all self-management programs are limited by participants' motivation to self-manage, and levels of attendance, engagement and adherence are low in many pain programmes [57, 58]. In the motivational model of pain self-management, a number of factors influence readiness to self-manage, which then influences self-management behaviours [59].

One recent study evaluated an intervention comprising an information booklet and DVD, which aimed to improve readiness to self-manage chronic joint pain among people with haemophilia [60]. The booklet described the difference between acute bleeding pain and chronic arthritic joint pain; the impact of pain on emotions and other aspects of life; the benefits and risks of using pain medication; and the benefits of active self-management and exercise. The DVD aimed to increase motivation to self-manage by addressing factors identified in the motivational model of pain self-management, but with all the information and messages delivered by five men with haemophilia who described their own experiences of living with joint pain, including its impact on their lives and how they had adjusted their life goals and values accordingly [60].

The booklet and DVD were evaluated in a 6-month trial in which all the participants received the booklet and a randomly selected half also received the DVD. Compared with those who received only the booklet, motivation to self-manage chronic joint pain improved among those who received the DVD, as evidenced by reduced 'precontemplative' attitudes and beliefs (for example, believing that pain is a purely medical problem that can only be addressed by doctors). Active pain coping also increased among participants generally, and measures of active involvement in learning pain self-management strategies and incorporating those strategies in everyday life increased among those who reported reading or watching the materials [60]. Evidence like this suggests that people with haemophilia respond to initiatives to improve readiness to self-manage pain in ways that are similar to people with other painful chronic conditions, so there should be scope to extend and improve services and materials for people with haemophilia by adapting those developed for other conditions.

Recommendations for pain self-management interventions

Interventions to improve self-management of chronic joint pain for people with haemophilia should have two aims. First, they should aim to reduce the severity of pain that people experience, which should lead to improved physical functioning and quality of life. Second, they

should aim to promote attitudes and beliefs that reflect better adjustment and adaptation to chronic joint pain, such as pain acceptance, which should lead to improved psychological wellbeing and mental quality of life. This second aim would place less emphasis on short-term pain relief, so there is potential for tension or conflict between these two broad aims. All self-management interventions should therefore be very carefully designed to take into account the specific needs of the people for whom they are intended, and should take specific care not to reduce the importance that should be attached to prompt treatment of acute bleeding episodes with clotting factor.

Reducing joint pain severity will require better assessment of pain and better knowledge and understanding of pain relief. Pain assessment could be improved by adopting and adapting methods that have been developed for other chronic pain conditions [61]. A minimum requirement is to differentiate acute bleeding pain from chronic arthritic pain, so that acute bleeding episodes can be promptly treated with clotting factor. This is especially important for children with haemophilia, in order to prevent future joint damage, so self-management interventions for children could incorporate psychological techniques that have been shown to improve adherence during factor administration [62].

Knowledge about pain relief is needed to enable people to choose the most effective analgesics and to find the right balance between using pain medication to maintain everyday roles and activities, and becoming or feeling dependent on pain medication. This means providing guidance based on information about pain medications, like that given by Holstein and colleagues [7], and guidance about the differences between genuine symptoms of dependence and unfounded concerns or perceptions about addiction. In this as with other aspects of self-management, there are approaches and instruments that have been developed from research on other painful conditions that could be adapted for haemophilia, for example to differentiate genuine drug dependence from ‘pseudoaddiction’ [63], and to assess people’s concerns about their patterns of use of pain medication [64].

To improve psychological wellbeing and quality of life, increasing pain acceptance may be a useful behavioural target, as discussed earlier. Acceptance-based programmes for people with chronic pain conditions typically involve small group exercises including exposure, habit reversal training, mindfulness meditation and sensation focusing [65]. Those approaches may need refinement and adaptation to take account of the nature of haemophilia and how the condition should be managed. Pain acceptance has multiple understandings and interpretations [66], so it has to be interpreted flexibly in different contexts. Tools like the clinical pain acceptance Q-sort can be used to explore pain acceptance in clinical contexts [67], and may be helpful both for understanding the distinctive aspects of effective pain acceptance in haemophilia, and as a therapeutic tool for interventions to discuss and promote pain acceptance in a sensitive, diplomatic way. Above all, any acceptance-based interventions should be designed and delivered in ways that take specific care not to reduce the priority that all people with haemophilia should attach to prompt treatment of acute bleeding episodes with clotting factor.

Based on what is known so far, pain self-management interventions for people with haemophilia could include elements to:

- Improve assessment of joint pain and other pain related to haemophilia;
- Increase understanding of the difference between acute and chronic pain;
- Improve adherence to clotting factor treatment for acute bleeding pain;
- Improve knowledge and understanding about the benefits and costs of using pain medications;
- Improve judgments about what is excessive use of pain medication;
- Increase positive motivation to self-manage pain;
- Reduce beliefs and attitudes that are obstacles to self-management;
- Reduce negative emotional thinking about pain; and
- Increase acceptance of chronic joint pain.

Different elements of interventions could be delivered in different ways. For example, increasing knowledge and understanding about pain and pain medication might involve presenting written information in textual form, whereas increasing motivation to self-manage might involve narrative filmed materials, and increasing pain acceptance might involve individual or small group discussion and exercises. Intervention elements might also be selected and combined in different ways, depending on whether interventions focused more on improving short-term pain self-management or longer-term quality of life and wellbeing. Different formats and media could be combined to maximize impact, consistent with recent evidence about multi-media materials [68], and ways that print and filmed materials can be effectively combined [69].

Groups with special pain management needs

The groups most obviously in need of improved pain management are those without access to clotting factor treatments, for whom periodic acute bleeds will continue to influence illness burden and quality of life. This includes those living in most of the developing world, but also many developed countries, for surveys of haemophilia care in Europe show variations in availability of clotting factor treatments, especially for adults [70, 71]. There is a strong case for haemophilia researchers and practitioners to campaign for greater international equality in care for haemophilia, but in the meantime behavioural self-management of both acute and chronic joint pain will continue to have special importance in less wealthy countries. So far almost all the research on pain management and self-management in haemophilia has taken place in Europe or North America, so more international evidence is needed from other continents.

Other groups with special needs include people with inhibitors, people with very severe or complicated conditions, older people, children, and women with bleeding disorders. People with inhibitors, which prevent clotting factors being effective, are especially susceptible to the effects of acute bleeds; one study with daily assessments showed that quality of life for people with inhibitors was impaired on days of acute bleeds beyond the baseline level of non-bleed

days [72]. People with very severe haemophilia, or with complications or co-existing conditions that make them frail or medically compromised, also require especially careful evaluations for pain management [73].

Older people with haemophilia are more likely to have severe arthropathy, with predictable consequences for quality of life [74]. Older people with mild haemophilia may also be at increased risk of inhibitor development, and pain control for older people may be complicated by contraindication of otherwise effective analgesics [10]. More research is needed on behavioural aspects of pain self-management among older people, and on whether specific types of intervention or modes of delivery would help older people with haemophilia to self-manage joint pain better.

More research is also needed on developmental processes and children's experiences of pain related to haemophilia. This is important because qualitative research has shown how pain affects children's perceptions of haemophilia and their experiences of treatment [75], but also because adherence to clotting factor treatment early in life is vital for long-term avoidance of arthropathy, and psychological interventions have been effective in improving children's adherence to clotting factor treatment [62].

Joint bleeds are not usually a predominant symptom of bleeding disorders that affect women as well as men, such as von Willebrand disease, but that disorder can also cause arthopathy and joint pain. More research is needed about joint pain among women with bleeding disorders, including the possibility of preventative treatment with clotting factor concentrates [76].

Conclusions

Research on self-management of chronic joint pain in haemophilia shows that behavioural and psychological factors influence outcomes in ways that are similar to other chronic pain conditions, which means that treatment approaches developed for other chronic pain conditions could be adapted for haemophilia. This also means that studies of people with haemophilia can inform wider theoretical debates about self-management of chronic pain, which have so far been informed mainly by evidence from other chronic pain conditions.

In haemophilia as in other conditions, pain intensity influences physical quality of life, and there should be scope for increasing quality of life by improving pain management. Again as in other chronic pain conditions, pain acceptance influences mental quality of life, so acceptance-based approaches to self-management could potentially be adapted for people with haemophilia, provided that the adaptations took account for the need for people with haemophilia to respond promptly to acute bleeding pain by administering clotting factor.

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